

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Leiuperidae, *Physalaemus bokermanni*: Distribution extension.

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Physalaemus bokermanni Cardoso & Haddad, 1985 (Figure 1) belongs to the *Physalaemus signifer* group, which is widely distributed throughout the Atlantic Forest (see Frost 2006). Nevertheless, *P. bokermanni* is only known to inhabit the type locality in the Serra de Paranapiacaba (23°45' S, 46°22' W; municipality of Santo André), in the state of São Paulo, Brazil.



Figure 1. *Physalaemus bokermanni* from Serra de Paranapiacaba, municipality of Santo André, state of São Paulo, Brazil. Photo by A. J. Cardoso.

During recent surveys, we found *P. bokermanni* in two new localities: 1) Barra do Una, municipality of São Sebastião (23°43'31" S, 45°45'11" W, collected in 17 October 2005), and 2) Ilha do Tatu, an urban region of the municipality of Cubatão (23°55'27" S, 46°25'14" W, collected in 12-14 July 2006). Thus, our observations provide new records of the poorly known *P. bokermanni* and extend the distribution approximately 62 km NE and 20 km SW, as well as its altitudinal range up to at least 750 m (Figure 2).

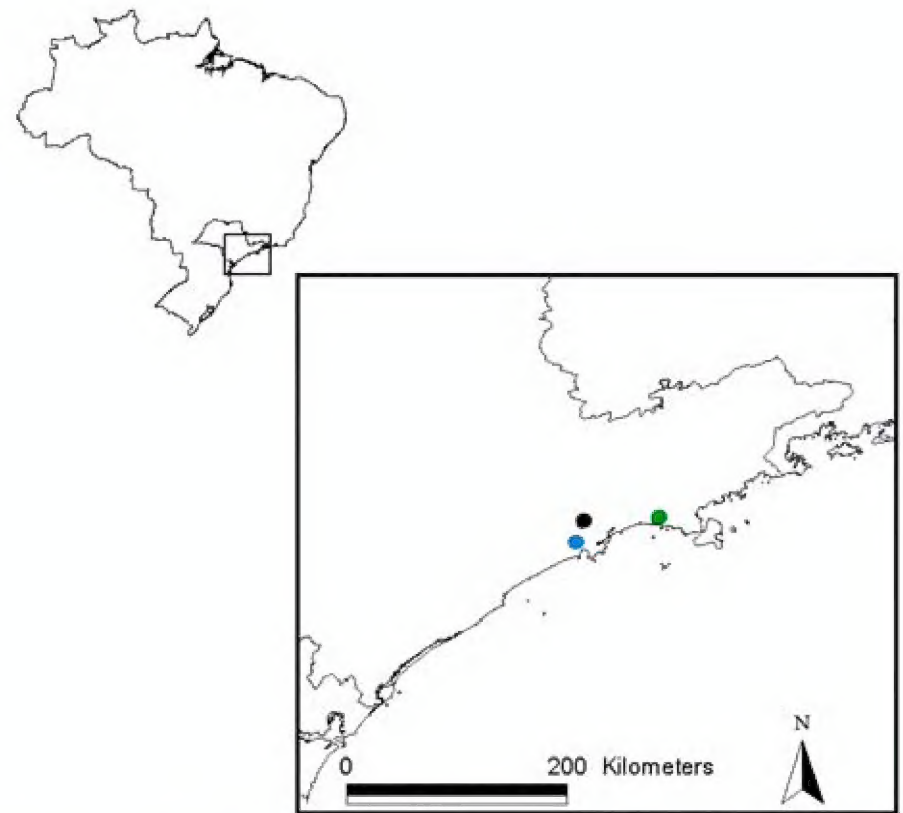


Figure 2. Distribution records of *Physalaemus bokermanni*, in the state of São Paulo, Brazil. Blue: Ilha do Tatu (municipality of Cubatão); black: type locality; green: Barra do Una (municipality of São Sebastião).

The identification of the *P. signifer* group is difficult and may depend on vocalization analysis (Haddad and Pombal 1998). We recorded advertisement calls of *P. bokermanni* in both localities, and they were similar to the original description (Cardoso and Haddad 1985) (Table 1). There was some variation in the size of individuals, although it was not statistically significant ($ANOVA F = 3.32; P = 0.08$); average snout-vent length of males was a little shorter in the populations of Barra do Una and Cubatão compared to the population found in its type-locality (Table 2).

Individuals were found calling near ponds inside the lowland forests, a variation of Atlantic forest restricted to the shores characterized by flat relief and frequent flooding. We observed signs of disturbance by human activity in both study sites, especially in Ilha do Tatu, which consists of a small area (around 2 ha) completely surrounded by residential areas and roads. Despite these disturbances, populations of *P. bokermanni* appeared healthy. Individuals were in reproductive activity in July and October, apparently presenting a prolonged pattern of reproduction (*sensu* Wells 1977), and we observed clutches in Ilha do Tatu and juveniles in Barra do Una.

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Table 1. Comparisons of advertisement calls of three populations of *Physalaemus bokermanni* from the state of São Paulo, Brazil.

	Paranapiacaba *	Ilha do Tatu **	Barra do Una ***
Pulses per note	4-5	5-8 ($\bar{x} = 5.8 \pm 0.9$; N= 30)	5-7 ($\bar{x} = 5.3 \pm 1.6$; N= 5)
Note duration (s)	0.2	0.17- 0.25 ($\bar{x} = 0.2 \pm 0.1$; N= 17)	0.18- 0.3 ($\bar{x} = 0.2 \pm 0.1$; N= 5)
Interval between note (s)	0.4 – 0.6	0.2-0.7 ($\bar{x} = 0.3 \pm 0.2$; N= 17)	0.2-0.3 ($\bar{x} = 0.3 \pm 0.1$; N= 5)
Frequency range (kHz)	2.5 – 5.2	1.8 – 5.3	1.8 – 4.8

* Calls reported by Cardoso and Haddad (1985), air temperature 18 °C; ** Calls from three individuals, air temperature 17-19 °C; *** Calls from one individual, air temperature 18.5 °C.

Table 2. Snout-vent length of adults of three populations of *Physalaemus bokermanni* from the state of São Paulo, Brazil.

	Paranapiacaba *	Ilha do Tatu	Barra do Una
Males	15.3-17.0 ($\bar{x} = 16.2 \pm 0.7$; N= 5)	15.1-15.3 ($\bar{x} = 15.2 \pm 0.1$; N= 2)	14.0-15.8 ($\bar{x} = 15.1 \pm 0.8$; N= 5)
Females	-	17.1 (N= 1)	15.5-17.9 ($\bar{x} = 17.1 \pm 0.9$; N= 8)

* Data from Cardoso and Haddad (1985)

According to the GAA (Global Amphibian Assessment) and IUCN (2006), *P. bokermanni* is listed in the “DD” (data deficient) category. However, GAA states that on the basis of current information regarding distribution and habitat status, *P. bokermanni* qualifies for listing as Critically Endangered or Endangered (IUCN 2006). The conservation status of *Physalaemus bokermanni* does not seem to be of concern to Brazilian authorities as it is not on the Official List of Brazilian Fauna Threatened with Extinction (Brasil 2006).

Little is known about the distribution and abundance of Brazilian anuran fauna (see Pimenta et al. 2005). As a result, visits to new localities often seem to lead to reconsideration of the conservation status of endangered species (see recent examples in Peloso and Gasparini 2006; Marques et al. 2006). These records, together with ours, support the idea that the inclusion of anuran species on “red lists” should be avoided as long as knowledge about the real distribution of species is deficient, and highlight the importance of natural history information.

Voucher specimens were collected and deposited at the Célio F. B. Haddad anuran collection, Departamento de Zoologia, Universidade Estadual Paulista, Rio Claro, São Paulo, Brazil (Cubatão: CFBH 12505-12507; São Sebastião: CFBH9766-9775 and 12897-12899).

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